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A SPIROCHETE ASSOCIATED WITH INFECTIONS OF THE ACCESSORY SINUSES.*

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In examining the smears from the nose of 32 cases of acute and chronic rhinitis, a spirochete, staining deeply with carbol-gentian-violet was observed in seven cases. In six of these it was found in connection with infections of the accessory sinuses. In the other case no history could be obtained except that of a severe acute rhinitis. In an infection of the frontal sinuses this spirochete appeared to be the only organism present in the smears.

The organism has two or three regular curves, the ends being as a rule pointed and generally parallel to the long axis (Fig. 1). Inside and protruding from them are occasionally seen deeply staining bodies about three times the width of the spirochete, which measures from two and one-half to five microns in length and one-half of one micron in width. It is a strict anaerobe and was isolated in pure culture on goat blood agar in large test tubes, the agar being slightly alkalin to phenolphthalein. The cultures were grown anaerobically according to the method of Wright, by saturating the cotton stopper with a strong solution of pyrogallic acid in a five per cent solution of sodium hydroxid, closing the tube with a tightly fitting cork and sealing it with paraffin. The growth appeared on the surface after seven days' incubation as a dull,

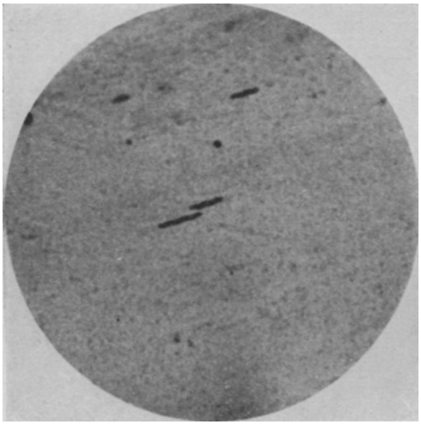

FIG. 1.—Smear from nose. Antrum infection. × 1200. Carbol-gentian-violet.

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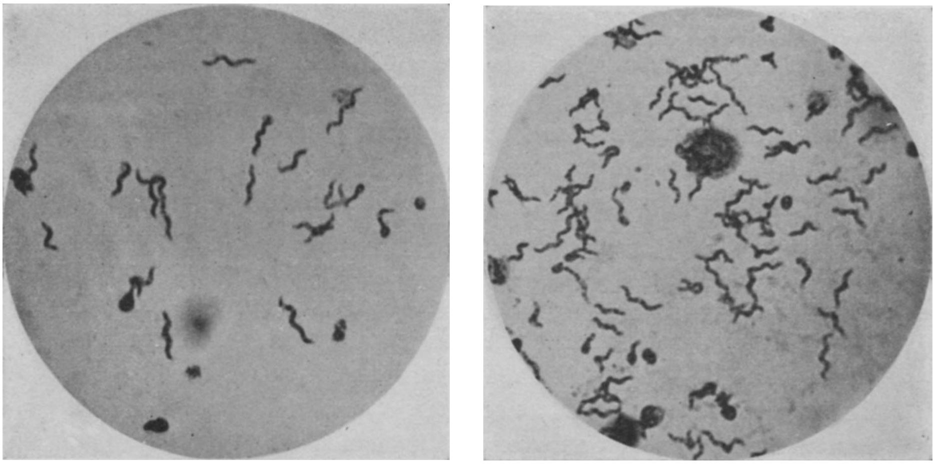
radiating growth, later also in the fluid of condensation. In subcultures it formed raised, pin point colonies near the fluid of condensation, the rest of the growth being dull and rather profuse. The growth at first was mucoid, but lost this characteristic after being transplanted several times. The organism also grew in ascites and dextrose agar but produced no change in the media. There was no odor from the cultures.

In cultures (Figs. 2 and 3) the spirochetes measure about six microns in length and seven-tenths of a micron in width. They show from two to four curves, sometimes more, and have a tendency to be irregular in shape but often appear just like those in the mucus. Chains of two or three spirochetes joined by a fine filament are occasionally seen. They frequently stain irregularly. Oval, round, only slightly curved bacillary forms are seen. Deeply staining bodies and rings may be attached to the ends, and with the Giemsa stain two or three red stained bodies are brought out inside the spirochetes, which stain fairly well with methylene blue, carbol-thionin, carbol-fuchsin, and retain Gram's stain. The spirochete possesses many curved flagella on its ends and sides; the free round bodies also appear to possess flagella. After growing about seven days the spirochete disintegrates suddenly, leaving many poorly



FIGS. 2 and 3.—Pure cultures, eight days old. × 1200. Carbol-gentian-violet.

stained bodies as a result. The organism is commonly motile having a swift darting movement and some rotary motion; the refractile bodies present are also actively motile.

It is not pathogenic when injected into the nose of a dog.

This spirochete does not look like the "irregularis" and "undulata" mentioned by Gerber,[1] as having been seen in a case of rhinitis sicca and in an ulcer of the nose, nor does it resemble the fine spirochetes sometimes seen in the nose, which look like those in the mouth. Culturally this spirochete does not appear to correspond to any of the spirochetes already isolated in pure culture. The two spirochetes which this organism resembles culturally are *Treponema macrodentium* and *Spirochaeta refringens*, both isolated in pure culture by Noguchi.[2] The first differs from this nose spirochete in the greater length of its viability, the swinging or vigorously vibrating movement, its greater length in old cultures, and the fact that it requires tissue for its growth, produces a hazy growth and possesses flagella-like projections only on one or both ends. *Spirochaeta refringens* differs from it in its greater length; its shape, the middle being as a rule merely wavy, the two extremities being more regularly and deeply curved; in forming hazy colonies; in possessing fine, long, more or less elastic projections, which have minute curves; and in the motion of the flagella-like projections rotating around the spirochete, the spirochete remaining motionless, or traversed by waves.

The significance of this nose spirochete is yet to be determined.

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[1] *Centralbl. f. Bakteriol.*, 1910, 56, p. 508.

[2] *Jour. Exper. Med.*, 1912, 15, pp. 81 and 466.